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ABSTRACT

This study investigated the long-term stability of the nine temperament subcategories which underlie the Thomas and Chess temperament clusters. A homogeneous sample of 55 children and parents was recruited (26 remained at the final data collection interval) and parents provided questionnaire responses on their child's temperament at 2, 4, 6, 18, and 39 months; and at 5, 6, and 9 years. All children were first-born from European-American, upper middle class, two-parent families living in a midwestern suburb. The sample was evenly divided between males and females. Chronbach alpha coefficients and bivariate correlation coefficients were calculated to assess overall levels of agreement across the eight assessment periods. The results indicated that there was remarkable stability over time in threshold for stimulation, rhythmicity/predictability, activity level, distractibility, mood, response, and adaptability scores, suggesting that these subcategories reflect enduring characteristics of the child. Chronbach alpha levels ranged from .72 to .87. The two final dimensions, persistence and approach, were stable during the infancy period only. The Chronbach alphas for this period were .69 and .63. (Ten tables delineate findings. Contains 10 references.) (Author/KDFB)

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Temperamental Stability From Birth to Nine Years

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Abstract

This study investigated the long-term stability of the nine temperament sub-categories which underlie the Thomas and Chess temperament clusters. A homogenous sample of 55 children and parents was recruited (26 remained at the final data collection interval) and parents provided questionnaire responses on child's temperament at 2-, 4-, 6-, 18-, and 39- months, 5-, 6-, and 9-years. Bivariate correlation coefficients and Chronbach alpha assessments of stability for each dimension revealed remarkable stability over time in **threshold for stimulation**, **rhythmicity/predictability**, **activity level**, **distractibility**, **mood**, **response**, and **adaptability** scores, suggesting that these sub-categories reflect enduring characteristics of the child (Chronbach alpha levels ranged from .72 to .87). The two final dimensions, **persistence** and **approach**, were stable during the infancy period only (Chronbach alpha's for this period were .69 and .63).

During the past several decades considerable attention has been directed toward the question of whether or not an infant's temperamental qualities, or the characteristic manner in which the infant approaches and reacts to the environment, are enduring traits that persist through infancy, into childhood, and beyond. Researchers have been interested in determining if perhaps temperamental components are the early precursors of later personality traits (Sanson & Rothbart, 1995; Bates & Wachs, 1994; Martin, 1993).

Although a number of conceptualizations of temperament have been provided in the literature, perhaps the best known is that of Thomas and Chess (1963) who proposed three general patterns of child temperament--easy, difficult, and slow-to-warm--with hypothesized parallels to adult personality traits. In the Thomas and Chess paradigm, these general patterns are in fact composite clusters derived from a set of nine categories (**activity level**, **adaptability**, **approach/withdrawal**, **distractibility**, **mood**, **response**, **threshold of stimulation**, **persistence**, and **rhythmicity/predictability**). Research addressing the stability of these three clusters indicates modest support for stability in general temperament categories for at least six month periods (Plomin et al., 1993; Stifter & Fox, 1990), thereby supporting the notion that temperament is an enduring characteristic trait of the child.

Less information is available, however, regarding the stability of the nine dimensions which make up the three general temperamental clusters described by Thomas and Chess. This dearth may be in part a result of the common theoretical perspective that even though there might be variability in particular temperamental attributes, general temperamental patterns are assumed to characterize the individual and persist over longer periods of development. Although there are certainly some advantages to examining consistency within temperamental patterns, such an approach might obscure differences in long-term stability across the different temperamental

dimensions themselves. The purpose of this study, therefore, was to examine the long term stability of individual temperament dimensions from 2 months to 9 years of age. It was anticipated that, despite the enormous changes which take place within the individual and community, most of the dimensions would show stability from infancy until middle childhood.

Method

Subjects

Information was collected from 55 children and parents who were recruited as part of a longitudinal study of infant development. A sample of 26 children and their parents remained in the study from the child's birth until nine years of age. Comparisons of background demographic variables (child's chronological age, child's IQ, maternal education, and paternal education) indicated there were no statistically significant differences between the children who dropped out or remained for the duration of the study. All participants were first-born children from Euro-American, upper-middle class, two-parent families living in a midwestern suburb. The sample was evenly divided between males and females (56.4% and 43.6% respectively). On average, both parents had received collegiate degrees (father's mean years of education was 17.26, with a standard deviation of 1.83, and mothers' mean years of education was 16.28, with a standard deviation of 1.75). The average maternal age at the time of the child's birth was 28.77 years (with a standard deviation of 2.85). The sample was selected to be relatively homogeneous in socio-economic background so that the stability of different temperamental characteristics could be examined in the absence of marked deviations due to environmental influences.

Materials and Procedure

Assessments for this investigation were made in nine areas of temperament as described by Thomas and Chess (1963). **threshold of stimulation**, or the level of stimulation necessary to evoke a response; **rhythmicity/predictability**, or the degree of or regularity in a child's behavior; **activity level** or the energy level of the child; **distractibility**, or the child's ability to disregard environmental stimulation, **mood**, or the quality of the child's emotional state; **response**, or the intensity level of a child's reaction; **adaptability**, or the length of time to respond to a new situation; **persistence**, or attention span; and **approach**, or whether the child's initial response to new stimulus is to approach or withdraw. Parental reports of infant/child temperament were obtained at 2-, 4-, 6-, 18- and 39- months, pre- and post- kindergarten, and at 9- years of age from four age appropriate forms of temperamental questionnaires developed by Carey and colleagues and derived from the work of Thomas and Chess in the New York Longitudinal Study (Fullard et al., 1984; Hegvik et al., 1982; Thomas et al., 1977; Carey, 1973). Data from these different forms were adjusted to equate the direction of effects within dimensions across forms.

Results and Discussion

The question to be addressed from these data was the degree to which the assessments of the individual children along the nine temperamental dimensions proposed by Thomas and Chess remained stable from 2 months to 9 years of age. To examine this question, Chronbach alpha coefficients were computed to assess overall levels of agreement across the eight different assessment periods. The results of this analysis indicated that in all but two of the nine dimensions there was a remarkable level of overall stability across timepoints. As can be seen in Table 1, Chronbach alpha levels ranged from Chronbach α=.72 for **adaptability** to Chronbach α=.87 for **threshold of stimulation**, indicating extremely high test-retest reliability of these measures over a

nine year assessment period. Even for the two weaker measures, **approach** and **persistence**, moderate levels of stability were attained with overall Chronbach alpha levels of .58. When these two measures were examined within the first three infancy period assessments (2-, 4-, and 6-months), the respective Chronbach alpha levels were .63 and .69 respectively.

When the data were further examined via exploring bivariate correlation matrices for all possible correlations of each temperamental dimension at the eight different assessment intervals, the data continued to support the stability of these temperamental dimensions throughout early childhood. Specifically, 231 of the 252 correlations (92%) were positive, as contrasted with a null prediction of 115.5. A sign test indicated that the probability of achieving such a high number of positive correlations by chance is less than .001. Moreover, 92 (or 36.5%) of these positive correlations were statistically significant. Again, although one might expect 12.6% of the correlations to be significant by chance, this result far exceeded that expectation, further providing support for the view that the nine temperamental dimensions described by Thomas and Chess do, in fact, demonstrate significant levels of stability from 2 months to 9 years of age.

Within each of the separate temperament categories, however, there were slight differences in overall patterns of stability from infancy through early childhood. In the following sections these results are discussed for each of the constellations beginning with the most stable and continuing to the least stable temperament sub-category over time.

Threshold of Stimulation

The data suggested strong consistency in the measures obtained for the children's **threshold of stimulation** from birth through 9 years (Chronbach's α=.87). Not surprisingly, the largest bivariate correlations (illustrated in Table 2) between measures for **threshold of stimulation** were obtained for adjacent observations; in fact all seven adjacent observations were highly statistically

significant ($p < .01$). In addition all 28 correlation coefficients assessing the strength of the relationship among the different measures of the child's **threshold of stimulation** were positive, with 15 of the significantly so ($p < .05$). A sign test assessing the probability that all of the correlation coefficients would be positive by chance indicated that such an occurrence was unlikely ($p < .001$). Taken together, these results indicated that a child's **threshold for stimulation** was quite stable from infancy through middle childhood, suggesting that this particular temperament category reflects an enduring characteristic of the child.

Rhythmicity/Predictability

The next temperamental dimension, **rhythmicity/predictability**, revealed a pattern of temporal stability similar to that observed for the dimension threshold of stimulation. The overall measure of agreement among the different assessments of **rhythmicity/predictability** indicated a high level of consistency (Chronbach's $\alpha = .81$). Moreover, among the 28 bivariate correlation coefficients depicted in Table 3, all but three were positive (according to a sign test, such a result would be expected by chance less than 5% of the time) and ten correlations were statistically significantly greater than zero ($p < .05$). Specifically, children's **rhythmicity/predictability** scores at 2 months were significantly correlated with their 4-, 6-, and 18- month scores, $r = .56$ ($p < .001$), $r = .49$ ($p < .001$), $r = .32$, ($p < .05$). This indicated that **rhythmicity/predictability** was especially stable during the first eighteen months. In addition, the bivariate correlation coefficient between **rhythmicity/predictability** at 3- and 9- years was also .68 ($p < .001$). These data illustrated consistency in the child's **rhythmicity/predictability** over the long-term and suggested the early presence of another enduring trait in the child.

Activity Level

Like the previous temperament dimensions, a child's **activity level** was also stable from infancy through middle childhood (Chronbach's α=.79). The bivariate correlation matrix revealed that all but one of the possible correlation coefficients were positive (an outcome attained by chance less than .1 times in a hundred) and that 15 of these positive correlations were statistically significant ($p<.05$). Moreover, as can be seen in Table 4, statistically significant **activity level** correlations were obtained for all seven of the adjacent observations suggesting good short-term continuity in this measure. Significant stability was also observed over the full nine year period, as seen for example in the bivariate correlation of measures of **activity level** obtained at 4 months and 9 years (r=.40, $p<.05$). Although not statistically significant, a correlation of .21 was obtained between the 2 month and the 9 year activity level scores. These data suggested that **activity level**, like **threshold of stimulation** and **predictability**, is a relatively enduring individual characteristic of the child.

Distractibility

The pattern of children's **distractibility** scores, like the preceding four temperamental dimensions, was consistent over childhood (Chronbach's α=.75). All but two of the 28 bivariate correlation coefficients were positive (an outcome expected by chance less than 1% of the time) and seven of these correlations were statistically significant ($p<.05$). Moreover, the results indicated that assessments of a child's **distractibility** (or concentration skills) were statistically significantly related for the first half-year (see Table 5). Results further suggested a relationship between the 2- and 4- month measures and later measures of **distractibility** (e.g. 2 month scores were significantly related to 39 month scores r=.38, $p<.05$ and 4 month scores were significantly

related to post-kindergarten scores, $r=.38$, $p<.05$). All of the correlations between 9 years and the earlier observation periods were positive, although none were statistically significant. In general, the **distractibility** dimension appeared stable during early childhood and was modestly related to 9 year scores, again pointing to the presence of an enduring temperamental characteristic.

Mood

The data indicated that there was overall consistency in the assessments of **mood** quality from infancy until 9 years (Chronbach's $\alpha=.72$). It was noteworthy that of the 28 independent correlations for **mood**, all but one were positive (see Table 6). A sign test demonstrated that the probability that 27 of the 28 correlations would be positive by chance was less than .001. Furthermore, 12 of the correlation coefficients were statistically significant ($p<.05$), whereas only 1.4 of these would be expected to be significant by chance. Moreover, the 9 year measure of **mood** quality was significantly related to a number of earlier assessments of this trait. Specifically, the correlation between **mood** at 4 months and 9 years was .38 ($p<.01$); the correlation between measures at 18 months and 9 years was .45 ($p<.95$), the correlation between 39 months and 9 years was .55 ($p<.05$); and the correlation between the 5- and 9- year measure of **mood** was .58 ($p<.01$). The level stability in **mood** scores over the course of the project suggested that this particular dimension also reflects an enduring characteristic of the child.

Response

Children's intensity of **response** was also stable during early childhood (Chronbach's $\alpha=.79$). All but three of the bivariate correlation coefficients assessing the relationship of different measures of this dimension were positive ($p<.05$) and eight of these correlations were significantly greater than zero (see Table 7). **Response** scores at 2 months were significantly related to 4- and

6- month scores (r=.57, p<.001 and r=.55, p<.001). Furthermore, 4 month scores were also significantly related to 6- and 18- month scores (r=.50, p<.001 and r=.41, p<.01). This dimension, like the previous constellations, appeared stable during infancy and into early childhood, but the intensity of children's **responses** seemed less stable after 6 years of age. For example, although these were not statistically significant, the 9 year old scores were slightly negatively correlated with pre- and post- kindergarten scores. This pattern of results suggested that something about attending kindergarten might influence a child's reactions to situations. Overall intensity of **response** patterns point to this dimension as a stable characteristic from infancy through the preschool period, but not as a stable predictor of **response** characteristics in middle childhood.

Adaptability

The overall measure of the consistency in measures of **adaptability** from 2 months to 9 years was relatively strong (Chronbach's α=.72). Examination of the pattern of bivariate correlations suggested that the children exhibited strong consistency in **adaptability** scores from birth until the end of kindergarten, but this relationship declined by age 9 (see Table 8). The correlation between 2 month and 6 year **adaptability** scores was .59 (p< .001). All of the 28 correlation coefficients were positive; in fact, scores post kindergarten were significantly correlated with **adaptability** scores at 2 months (r=.59, p<.001), 4 months (r=.39, p<.05), and 6 months (r=.40, p<.05). The correlations between 9 year **adaptability** scores and earlier timepoints approached zero indicating that 9 year scores were less related to measures in infancy and early childhood. This suggested that after the initiation of formal schooling children's **adaptability** was less stable. Perhaps, as was the case for **response** intensity reactions, children's **adaptability** changed after kindergarten adjustments. Similar to other temperamental

dimensions--**threshold of stimulation**, **rhythmicity/predictability**, **activity level**, **mood**, and **response**--children's **adaptability** was stable from birth until 6 years.

Persistence

The eighth temperamental dimension, **persistence**, was also stable during the first six months (Chronbach's α=.69). Table 9 illustrates that two month **persistence** scores were significantly correlated with 6 month scores (r=.31, $p<.05$), 4 month scores were significantly related to both 6- and 18- month scores (r=.68, $p<.001$ and r=.33, $p<.05$). However, **persistence** showed a different pattern of results than the previous constellations over time. **Persistence**, unlike the previous dimensions, was relatively inconsistent after infancy with an overall Chronbach's α=.58. Beyond infancy children's **persistence** scores were in many cases negatively related to earlier scores (although not significantly so). Though they were not statistically significant, correlations between 2 month scores and **persistence** scores in later childhood (after 3 years) were - 11, -.18, 08, -.17 respectively. Four month **persistence** scores were also negatively correlated with 9 year scores (r=-.05, ns). Perhaps new experiences related to children's increased mobility and cognitive skills influenced their **persistence**. Children's **persistence** scores were positively stable through six months, but after infancy persistence scores were un-related to the earlier observations.

Approach

Approach, the final temperamental dimension, exhibited overall patterns similar to the measures of **persistence** previously discussed (overall Chronbach's α=.58). As was the case for all of the eight other temperamental dimensions, measures of **approach** scores were positive and consistent during infancy (Chronbach's α=.63). Two month **approach** scores were significantly correlated with 4- and 6- month scores (r=.42, $p<.001$ and r=.30, $p<.05$) while 4 month scores

were significantly related to 6 month scores ($r = .36$, $p < .001$). After 3 years **approach** scores exhibited an inconsistent pattern of negative and positive correlations with infancy measures (although not statistically significant) which suggested less long-term stability for this temperamental characteristic. For example, the correlation between 2 month scores and **approach** scores at 9 years was -.30. Eighteen month scores were significantly correlated with 3 year ($r = .50$, $p < .001$), 5 year ($r = .42$, $p < .05$) and 6 year ($r = .48$, $p < .001$) **approach** scores. This pattern could also reflect changes in a child's **approach** post-infancy due to increased locomotor skills or experiences. Children's **approach**/withdraw style was stable during infancy, but after six months consistency in approach scores declined indicating this dimension is not stable after the first half-year.

Conclusion

Consistent relationships were evident from infancy to middle childhood in seven of the nine temperament dimensions. These results provided indirect support of previous finding which indicated stability for Thomas and Chess' three general temperament clusters. The stability in children's **threshold of stimulation**, **rhythmicity/predictability**, **activity level**, **distractibility**, **mood, response**, and **adaptability** indicate these characteristics which were present early in children's development are constant. In most categories the strongest correlations were obtained for adjacent observations, but there were also strong relations across time and 92% of the correlations were positive. For both intensity of **response** and **adaptability** consistent patterns were present from early infancy until 6 years. We hypothesized that perhaps these dimensions were influenced by formal schooling so that patterns of **reaction** and **adaptability** changed after the kindergarten year. Cross-cultural investigations would be useful to untangle the impact of

academics on **adaptability** and intensity of **response** styles in schooled and non-schooled populations

Children's **persistence** and **approach** scores were stable during infancy observations, but thereafter were less related. The relative instability and change in these patterns post-infancy may have been the result of cognitive and motor skill growth or change. The inconsistency after 6 months could also have been the result of new social and environment demands (i.e., day care participation). Future investigations are necessary to uncover the particular sources which influence children's **persistence** and **approach** during infancy and beyond.

The long term stability of temperament sub-categories has implications for researchers interested in temperamental characteristics and personality at any developmental level. In particular, understanding the relationship between the seven dimensions which show some continuity from infancy to later child outcomes is crucial for tracing particular characteristics within and between dimensions. Finally, increased knowledge about these characteristics over time will contribute to the body of research investigating the stability of general temperament categories and relationship between particular characteristics and other applied developmental outcomes.

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Table 1. Chronbach Alpha Assessments of Temperamental Stability for the 8 Timepoints from Birth to Nine Years

Relatively Stable Throughout Childhood		Stable During First Half-year Only	
Threshold of Stimulation	α=.87	Persistence	overall α=.58 infancy α=.69
Rhythmicity/Predictability	α=.81	Approach	overall α=.58 infancy α=.63
Activity Level	α=.79		
Distractibility	α=.75		
Mood	α=.72		
Response	α=.79		
Adaptability	α=.72		

Table 2. Pearson Correlation Coefficients for **Threshold of Stimulation** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.72*** (52)	.69*** (52)	.35* (45)	.28 (38)	.29 (32)	.25 (31)	.19 (24)
4 mos.		-----	.75*** (52)	.39** (45)	.23 (38)	.26 (32)	.18 (31)	.22 (24)
6 mos.			-----	.44** (45)	.34* (38)	.34 (32)	.26 (31)	.10 (24)
18 mos.				-----	.43** (35)	.40* (30)	.41* (31)	.19 (22)
39 mos.					-----	.66*** (29)	.62*** (28)	.37 (19)
Pre-K						-----	.89*** (28)	.54* (19)
Post-K							-----	.57** (21)
9 years								-----

*** p<.001
** p<.01
* p<.05

Table 3. Pearson Correlation Coefficients for **Rhythmicity/Predictability** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.56*** (52)	.49*** (52)	.32* (45)	.02 (38)	.06 (32)	.01 (31)	.05 (24)
4 mos.		-----	.44*** (52)	.29* (45)	-.13 (38)	.12 (32)	.08 (31)	.04 (24)
6 mos.			-----	.41** (45)	.28 (38)	.09 (32)	-.17 (31)	.14 (24)
18 mos.				-----	.42** (35)	.39* (30)	.30 (31)	.34 (22)
39 mos.					-----	.49** (29)	.32 (28)	.68*** (19)
Pre-K						-----	.31 (31)	.15 (21)
Post-K							-----	-.08 (21)
9 years								-----

*** p<.001
** p<.01
* p<.05

Table 4. Pearson Correlation Coefficients for **Activity Level** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.39** (52)	.25 (52)	.25 (45)	.05 (38)	-.04 (32)	.22 (31)	.21 (24)
4 mos.		-----	.68*** (52)	.43** (45)	.15 (38)	.20 (32)	.24 (31)	.40* (24)
6 mos.			-----	.52*** (45)	.27 (38)	.26 (32)	.18 (31)	.48* (24)
18 mos.				-----	.69*** (35)	.63*** (30)	.60*** (31)	.47* (22)
39 mos.					-----	.59*** (29)	.51** (28)	.51* (19)
Pre-K						-----	.86*** (28)	.50* (19)
Post-K							-----	.36 (21)
9 years								-----

*** p<.001
** p<.01
* p<.05

Table 5. Pearson Correlation Coefficients for **Distractibility** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.38** (52)	.48*** (52)	-.06 (45)	.38* (38)	.16 (32)	-.13 (31)	.26 (24)
4 mos.		-----	.48*** (52)	.16 (45)	.26 (38)	.17 (32)	.38* (31)	.02 (24)
6 mos.			-----	.01 (45)	.23 (38)	.20 (32)	.03 (31)	.22 (24)
18 mos.				-----	.50** (35)	.13 (30)	.13 (31)	.35 (22)
39 mos.					-----	.26 (29)	.05 (28)	.34 (19)
Pre-K						-----	.44* (28)	.06 (19)
Post-K							-----	.11 (21)
9 years								-----

*** p<.001
** p<.01
* p<.05

Table 6. Pearson Correlation Coefficients for **Mood** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.27* (52)	.12 (52)	.15 (45)	.02 (38)	.20 (33)	-.06 (31)	.21 (24)
4 mos.		-----	.56*** (52)	.37** (45)	.26 (38)	.12 (33)	.28 (31)	.38** (24)
6 mos.			-----	.50*** (45)	.23 (38)	.29 (33)	.39* (31)	.22 (24)
18 mos.				-----	.44** (35)	.54** (31)	.31 (31)	.45* (22)
39 mos.					-----	.28 (30)	.55** (28)	.55* (19)
Pre-K						-----	.20 (29)	.33 (20)
Post-K							-----	.58** (21)
9 years								-----

*** p<.001
** p<.01
* p<.05

Table 7. Pearson Correlation Coefficients for **Intensity of Response** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.57*** (52)	.55*** (52)	.27 (45)	.09 (38)	.18 (32)	.27 (31)	.02 (24)
4 mos.		-----	.50*** (52)	.41** (45)	.25 (38)	.08 (32)	.05 (31)	.29 (24)
6 mos.			-----	.45** (45)	.30 (38)	-.04 (32)	.25 (31)	.06 (24)
18 mos.				-----	.64*** (35)	.29 (30)	.18 (31)	.21 (22)
39 mos.					-----	.43* (29)	.35 (28)	.13 (19)
Pre-K						-----	.66*** (28)	-.09 (19)
Post-K							-----	-.06 (21)
9 years								-----

*** $p<.001$
** $p<.01$
* $p<.05$

Table 8. Pearson Correlation Coefficients for **Adaptability** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.70*** (51)	.50*** (51)	.29 (44)	.10 (38)	.54*** (32)	.59*** (31)	.03 (24)
4 mos.		-----	.27 (51)	.28 (45)	.02 (38)	.29 (32)	.39* (31)	.10 (24)
6 mos.			-----	.21 (44)	.12 (38)	.20 (32)	.40* (31)	.00 (24)
18 mos.				-----	.55*** (35)	.27 (30)	.27 (31)	.17 (22)
39 mos.					-----	.38* (29)	.26 (28)	.38 (19)
Pre-K						-----	.66*** (28)	.16 (19)
Post-K							-----	.27 (21)
9 years								-----

*** p<.001
** p<.01
* p<.05

Table 9. Pearson Correlation Coefficients for **Persistence** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.21 (51)	.31* (51)	.23 (44)	-.11 (37)	-.18 (31)	.08 (30)	-.17 (23)
4 mos.		-----	.68*** (52)	.33* (45)	.28 (38)	.08 (32)	.05 (31)	-.05 (24)
6 mos.			-----	.25 (45)	.19 (38)	-.03 (32)	.14 (31)	.10 (24)
18 mos.				-----	.45** (35)	.21 (30)	.39* (31)	.03 (22)
39 mos.					-----	.07 (29)	.20 (28)	.34 (19)
Pre-K						-----	.65*** (28)	-.02 (19)
Post-K							-----	-.12 (21)
9 years								-----

*** p<.001
** p<.01
* p<.05

Table 10. Pearson Correlation Coefficients for **Approach** at Each Observation Period With Number of Subjects in Parentheses

	2 mos.	4 mos.	6 mos.	18 mos.	39 mos.	Pre-K	Post-K	9 years
2 mos.	-----	.42** (52)	.30* (52)	.05 (45)	.36* (38)	.29 (32)	.24 (31)	-.30 (24)
4 mos.		-----	.36** (52)	.03 (45)	.10 (38)	-.02 (32)	-.02 (31)	-.36 (24)
6 mos.			-----	.23 (45)	.19 (38)	.03 (32)	.11 (31)	-.24 (24)
18 mos.				-----	.50** (35)	.42* (30)	.48** (31)	.01 (22)
39 mos.					-----	.39* (29)	.47** (28)	.08 (19)
Pre-K						-----	.81*** (28)	.16 (19)
Post-K							-----	.08 (21)
9 years								-----

*** p<.001
** p<.01
* p<.05